



Claims

- 1. Process for producing a biocatalyst with a biologically active material, introduced into a gel of polyvinyl alcohol, in the form of microorganisms, enzymes, spores and/or cells with the process steps
 - a) Use of an aqueous polyvinyl alcohol solution with a degree of hydrolysis of ≥ 98 mol %.
 - b) The addition of an additive that is dissolved in the aqueous polyvinyl alcohol solution and forms a separate, finely distributed and aqueous phase after concentration of the solution.
 - c) Addition of the biologically active material
 - d) Dehydration of the aqueous solution to a maximum residual water content of 50 wt.% in order to cause the phases to separate and hence the polyvinyl alcohol to gel.
 - e) Rehydration of the polyvinyl alcohol in an aqueous medium.
- 2. Process according to Claim 1, in which the polyvinyl alcohol solution has a concentration of 4 30 wt.%, preferably 6 16 wt.%.
- 3. Process according to Claims 1 and 2, in which a water-soluble additive is used which has an affinity to water at least similar to that of the polyvinyl alcohol.

- 4. Process according to Claims 1 to 3, in which the water-soluble additive is selected from the group cellulose esters, cellulose ethers, starch esters, starch ethers, polyalkylene glycol ethers, polyalkylene glycols, long-chain alkanoles (n ≥ 8), sugar esters and sugar ethers.
- 5. Process according to Claim 4, in which polyethylene glycol is used as a water-soluble additive.
- 6. Process according to Claims 1 to 5, in which the water-soluble additive is used in a concentration of 4 20 wt.%, preferably 6 10 wt.%.
- 7. Process according to Claims 1 to 6, in which the dehydration of the aqueous solution is carried out until a residual water content of at least 10 wt.% is reached.
- 8. Process according to Claim 7, in which the dehydration of the aqueous solution is carried out until a residual water content of 10 30 wt.% is reached.
- 9. Process according to Claims 1 to 8, in which the dehydration process is carried out after dripping the solution onto a hard surface.
- 10. Process according to Claims 1 to 9, in which the dehydration process is carried out after pouring the solution into a form.

- 11. Process according to Claims 9 and 10, in which the dripping or pouring is carried out in such a way that the gel substance is formed with a diameter at least double its height.
- 12. Process according to Claim 11, in which the dripping or pouring is carried out in such a way that the gel substance is formed with a diameter of > 1 mm, preferably between 2 and 4 mm, and a height between 0.1 and 1 mm, preferably between 0.2 and 0.4 mm.
- 13. Process according to Claims 1 to 8, in which the dehydration process is carried out after pouring the solution to form a long strand.
- 14. Process according to Claims 1 to 13, in which the dehydration process is carried out after pouring the solution onto a base material.
- 15. Process according to Claims 1 to 14, in which the rehydration is carried out in tap water.
- 16. Process according to Claims 1 to 14, in which the rehydration is carried out in a saline solution.
- 17. Process according to Claim 16, in which a culture solution for the biologically active material is used as the saline solution.
- 18. Process according to Claims 16 and 17 using a saline solution containing polyvalent anions.

- 19. Process according to Claims 1 to 18, in which the dehydration process is completely carried out during the time the created drop falls in a drop tower.
- 20. Mechanically highly stable biocatalyst of polyvinyl alcohol, produced according to the process according to Claims 1 to 19.
- 21. Biocatalyst according to Claim 20, produced in a lenticular form in which the diameter is significantly greater than the height.
- 22. Biocatalyst according to Claims 20 and 21 with a magnetic additive.
- 23. Process for producing a product created by transformation with a biocatalyst according to Claims 20 to 22.
- 24. Process according to Claim 23 for producing 1.3-propane diol.
- 25. Process according to Claim 24 for producing itaconic acid.